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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/062,112	02/01/2002	Curtis E. Adams	00069CON	9977
7590	03/29/2005		EXAMINER	
Michelle B. Lando, Esq. CABOT CORPORATION Law Department 157 Concord Road Billerica, MA 01821			SHOSHO, CALLIE E	
			ART UNIT	PAPER NUMBER
			1714	

DATE MAILED: 03/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/062,112	ADAMS, CURTIS E.
	Examiner Callie E. Shosho	Art Unit 1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)  Responsive to communication(s) filed on 03 January 2005.

2a)  This action is **FINAL**.                    2b)  This action is non-final.

3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4)  Claim(s) 1-19 and 22-50 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5)  Claim(s) \_\_\_\_\_ is/are allowed.

6)  Claim(s) 1,2,4-19,22-28,30-32,34-48 and 50 is/are rejected.

7)  Claim(s) 3,29,33 and 49 is/are objected to.

8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on \_\_\_\_\_ is/are: a)  accepted or b)  objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All    b)  Some \* c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)  Notice of References Cited (PTO-892)  
2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3)  Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_

4)  Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_

5)  Notice of Informal Patent Application (PTO-152)

6)  Other: \_\_\_\_\_

**DETAILED ACTION**

**Continued Examination Under 37 CFR 1.114**

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/3/05 has been entered.
  
2. All outstanding rejections except for those set forth in paragraphs 9 and 11 below are overcome by applicant's amendment filed 1/3/05.

**Claim Objections**

3. Claim 14 objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 14, which depends on claim 1, discloses that the polyvalent ion of the salt comprises polyvalent metal cation while claim 1 discloses that the salt comprises polyvalent cation. Thus, claim 14 fails to further limit the scope of the claim on which it depends, namely, claim 1, given that claim 14 recites limitation already disclosed in claim 1.

Should claim 14 be cancelled? It is noted that if claim 14 were cancelled, the dependencies of claims 15-17 must be changed.

**Claim Rejections - 35 USC § 103**

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1-2, 4-17, 22-28, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Betto et al. (U.S. 6,406,606) in view of WO 96/18695.

Betto et al. disclose ink comprising water, 1-13% polymer containing carboxyl group or sulfonic acid group wherein the polymer includes polyacrylic acid or styrene-acrylate copolymer, 3-18% electrolyte that includes alkaline earth metal halide such as calcium chloride, and 6.5-15% colorant that is self-dispersing colored pigment wherein the pigment includes carbon black as well as colored organic pigments. There is also disclosed method of generating an image

comprising incorporating the above ink into printer and generating image on substrate (col.4, lines 55-64, col.5, lines 53-55, col.5, line 64-col.6, line 12, col.6, lines 20-35 and 44-48, col.6, line 63-col.7, line 8, col.7, lines 44-45, col.16, line 45-col.17, line 51 and col.17, lines 65-66).

Although there is no disclosure that the ink of Betto et al. is an ink jet ink, given that Betto et al. disclose ink as presently claimed, i.e. comprising self-dispersing pigment, salt, and polymer with functional group, it is clear that the ink would intrinsically be capable of functioning as an ink jet ink.

Although there is no disclosure that functional group present on the polymer is capable of coordinating with the polyvalent ion of the electrolyte, given that Betto et al. disclose salt comprising polyvalent cation identical to that presently claimed and polymer comprising anionic functional group identical to that presently claimed, it is clear that the functional group of the polymer is intrinsically capable of coordinating with the polyvalent ion.

The difference between Betto et al. and the present claimed invention is the requirement in the claims of specific type of pigment.

Betto et al. disclose the use of self-dispersing pigment, however, there is no explicit disclosure of the functional groups attached to the pigment.

WO 96/18695, which is drawn to ink jet ink, discloses modified pigment comprising pigment such as carbon black having attached functional groups including carboxyl groups. The motivation for using such pigment is that it is easy to disperse in ink, there is no need for the ink to contain dispersant, and pigment has increased dispersability as compared to untreated pigment (page 4, line 26-page 5, line 5, page 5, lines 13-18, and page 6, lines 20-26 and 31-36, and col.7, lines 21-23).

Although there is no disclosure that functional group present on the pigment as disclosed by WO 96/18695 is capable of coordinating with the polyvalent ion of the electrolyte disclosed by Betto et al., given that WO 96/18695 discloses pigment having attached anionic functional group identical to that presently claimed and Betto et al. discloses salt comprising polyvalent cation identical to that presently claimed, it is clear that the functional group of the pigment is intrinsically capable of coordinating with the polyvalent ion.

In light of the motivation for using specific self-dispersing pigment disclosed by WO 96/18695 as described above, it therefore would have been obvious to one of ordinary skill in the art to use such pigment in the ink of Betto et al., and thereby arrive at the claimed invention.

6. Claims 31-32, 34-39, 41-45, 47-48, and 50 rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi et al. (U.S. 2004/0082686) in view of either Ichizawa et al. (U.S. 6,368,397) or Branham (U.S. 5,814,683)

Takahashi et al. disclose aqueous ink jet ink comprising water, cationic polymer comprising cationic functional group including ammonium group, cationic pigment that is modified pigment such as carbon black or organic colored pigment having attached at least one cationic functional group including amino group. There is also disclosed ink jet method comprising ejecting the ink from printer onto to substrate to generate image (paragraphs 3, 13, 20, 42-46, 74, 76, and 79).

The difference between Takahashi et al. and the present claimed invention is the requirement in the claims of salt containing polyvalent anion.

Ichizawa et al., which is drawn to ink jet ink, disclose the use of salt including those with polyvalent anion such as phosphate in order to control the pH of the ink in order to prevent the ink from producing adverse effects such as corrosion and dissolution or printer head material (col.12, lines 52-55 and 60-61).

Alternatively, Branham , which is drawn to ink jet ink, disclose the use of salt including those with polyvalent anion such as tartrate and sulfate in order to prevent color bleed (col.5, lines 34-42 and 53-54).

Although there is no disclosure that functional group present on the pigment or the functional group present on the polymer as disclosed by Takahashi et al. is capable of coordinating with the polyvalent ion of the salt disclosed by either Ichizawa et al. or Branham, given that Takahashi et al. disclose pigment having attached cationic functional group and polymer comprising cationic functional group identical to that presently claimed and either Ichizawa et al. or Branham disclose salt comprising polyvalent anion identical to that presently claimed, it is clear that the functional group of the pigment or polymer is intrinsically capable of coordinating with the polyvalent ion.

In light of the motivation for using salt comprising polyvalent anion disclosed by either Ichizawa et al. or Branham as described above, it therefore would have been obvious to one of ordinary skill in the art to use such salt in the ink of Takahashi et al. in order to produce ink that will not corrode printer head or, alternatively, to produce ink with reduced color bleed, and thereby arrive at the claimed invention.

7. Claims 40 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi et al. in view of either Ichizawa et al. or Branham as applied to claims 31-32, 34-39, 41-45, 47-48, and 50 above, and further in view of Tsang et al. (U.S. 6,150,433).

The difference between Takahashi et al. in view of either Ichizawa et al. or Branham and the present claimed invention is the requirement in the claims of pigment having attached polymer.

Tsang et al., which is drawn to ink jet ink, disclose the use of pigment having attached polymer wherein the polymer includes cationic polymer containing ammonium group in order to produce ink with reduced smear and increased water fastness, bleed control, and print quality (col.1, line 65-col.2, line 6, col.4, line 38, col.5, lines 6-7, col.6, lines 15-24, col.6, line 60-col.7, line 15, and col.10, lines 30-45).

In light of the motivation for using pigment with attached cationic polymer disclosed by Tsang et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such pigment in the ink of Takahashi et al. in order to produce ink with reduced and increased water fastness, bleed control, and print quality, and thereby arrive at the claimed invention.

8. Claims 1-2, 4-9, 11-17, 22-25, 27-28, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu (U.S. 5,889,083) in view of WO 96/18695.

Zhu discloses ink jet ink comprising aqueous liquid vehicle, pigment such as carbon black and cyan, magenta, and yellow pigments, polymer such as styrene-acrylate copolymer, acrylic copolymer, and acrylic acid-(meth)acrylate copolymer, and salt having polyvalent metal

cation such as calcium. There is further disclosed a method wherein the above ink is incorporated into ink jet printer and then printed onto substrate (col.1, lines 5-21, col.3, lines 16-22 and 27, col.5, lines 18-30 and 40-56, and col.9, line 61-col.10, line 10).

Although there is no disclosure that functional group present on the polymer is capable of coordinating with the polyvalent ion, given that Zhu disclose salt comprising polyvalent cation identical to that presently claimed and polymer comprising anionic functional groups identical to that presently claimed, it is clear that the functional group of the polymer is intrinsically capable of coordinating with the polyvalent ion.

The difference between Zhu and the present claimed invention is the requirement in the claims of modified pigment.

WO 96/18695, which is drawn to ink jet ink, discloses modified pigment comprising pigment such as carbon black having attached functional groups including carboxyl groups. The motivation for using such pigment is that it is easy to disperse in ink, there is no need for the ink to contain dispersant, and pigment has increased dispersability as compared to untreated pigment (page 4, line 26-page 5, line 5, page 5, lines 13-18, and page 6, lines 20-26 and 31-36, and col.7, lines 21-23).

Although there is no disclosure that functional group present on the pigment as disclosed by WO 96/18695 is capable of coordinating with the polyvalent ion of the salt disclosed by Zhu, given that WO 96/18695 discloses pigment having attached anionic functional group identical to that presently claimed and Zhu discloses salt comprising polyvalent cation identical to that presently claimed, it is clear that the functional group of the pigment is intrinsically capable of coordinating with the polyvalent ion.

In light of the motivation for using modified pigment disclosed by WO 96/18695 as described above, it therefore would have been obvious to one of ordinary skill in the art to use such pigment in the ink of Zhu in order to produce ink which does not require dispersant, and thereby arrive at the claimed invention.

9. Claims 10 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu in view of WO 96/18695 as applied to claims 1-2, 4-9, 11-17, 22-25, 27-28, and 30 above, and further in view of Tsang et al. (U.S. 6,150,433).

The difference between Zhu in view of WO 96/18695 and the present claimed invention is the requirement in the claims of pigment having attached polymer.

Tsang et al., which is drawn to ink jet ink, disclose the use of pigment having attached polymer wherein the polymer includes anionic polymer obtained from (meth)acrylic acid in order to produce ink with reduced smear and increased water fastness, bleed control, and print quality (col.1, line 65-col.2, line 6, col.4, line 38, col.5, lines 6-7 and 10-15).

In light of the motivation for using pigment with attached cationic polymer disclosed by Tsang et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such pigment in the ink of Takahashi et al. in order to produce ink with reduced and increased water fastness, bleed control, and print quality, and thereby arrive at the claimed invention.

10. Claims 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu in view of WO 96/18695 as applied to claims 1-2, 4-9, 11-17, 22-25, 27-28, and 30 above, and further in view of Lin (U.S. 5,997,623).

The difference between Zhu in view of WO 96/18695 and the present claimed invention is the requirement in the claims of specific type of salt.

Lin, which is drawn to ink jet inks, discloses using salt comprising polyvalent metal cation such as zinc and polyvalent metal anion such as sulfate in order to produce ink with conductivity suitable for ink jet printing. Lin also discloses the equivalence and interchangeability of such salt with calcium chloride as disclosed by Zhu (col.14, lines 55-56 and col.14, line 64-col.15, line 2).

In light of the motivation for using such salt disclosed by Lin as described above, it therefore would have been obvious to one of ordinary skill in the art to use such salt as the salt in Zhu, and thereby arrive at the claimed invention.

#### Response to Arguments

11. Applicant's arguments filed 1/3/05 have been fully considered but they are not persuasive.

Specifically, applicant argues that there is no motivation to combine Zhu with WO 96/18695 given that there is no disclosure in Zhu of modified pigment and no disclosure in WO 96/18695 of salt comprising polyvalent ion.

It is agreed that there is no disclosure in Zhu of modified pigment which is why Zhu is used in combination with WO 96/18695 which discloses the use of modified pigment identical to

that presently claimed and further discloses that it is advantageous to use modified pigment instead of conventional pigments given that modified pigments, i.e. having ionic functional group, are easier to disperse and do not require the use of dispersant.

Further, while there is no disclosure in WO 96/18695 of polyvalent salt, it is noted that when used in combination with Zhu, WO 96/18695 is used as teaching reference, and therefore, it is not necessary for this secondary reference to contain all the features of the presently claimed invention, *In re Nievelt*, 482 F.2d 965, 179 USPQ 224, 226 (CCPA 1973), *In re Keller* 624 F.2d 413, 208 USPQ 871, 881 (CCPA 1981). Rather this reference teaches a certain concept, namely the use of modified pigments in ink jet inks, and in combination with the primary reference, discloses the presently claimed invention.

Applicant also argues that one of ordinary skill in the art would not combine salt having polyvalent cation as disclosed by Zhu with pigment having anionic functional groups as disclosed by WO 96/18695 given that one of ordinary skill in the art would expect destabilization to occur. Applicant argues that while Zhu discloses that "any" pigment can be used, as previously argued by the examiner, there is no teaching or suggestion that any of the potential pigments can or should have attached anionic functional groups.

However, while it is agreed that there is no disclosure in Zhu that pigments having attached anionic functional groups are utilized, there is nothing in the reference that excludes the use of such pigment. That is, Zhu discloses the use of "any" pigment without restriction. Further, while applicant states that one of ordinary skill in the art would not combine modified pigment with polyvalent salt due to destabilization occurring, given that Zhu also discloses the use of polymer which is capable of coordinating with the salt having polyvalent cation, it is not clear

that one of ordinary skill in the art would have recognized that addition of modified pigment would destabilize the ink of Zhu. There is no evidence that such destabilization would occur in Zhu. Evidence to support this position is found, for instance in state-of-the-art references such as JP 2001-081378, which discloses ink comprising salt possessing polyvalent ion with self-dispersing pigment possessing functional group (abstract, paragraph 13) as well as in Betto et al. utilized above which discloses ink comprising salt possessing polyvalent ion with self-dispersing pigment (col.5, line 64-col.6, line 7 and col.6, line 65-col.7, line 6). Thus, it is clear that combination of polyvalent salt with self-dispersing pigment is successfully utilized in inks.

Applicant also argues that there is no guidance in WO 96/18695 or Zhu to produce ink comprising modified pigment, polyvalent salt, and polymer as presently claimed. That is, one could only arrive at the present invention through picking and choosing.

However, it is noted that Zhu requires the use of both binder and conductivity agent wherein the binder is polymer possessing anionic functional group and the conductivity agent includes alkaline earth metal salts that possess polyvalent cation. It is noted that the binder of Zhu is water-soluble or dispersible binder such as acrylic copolymer, styrene maleic anhydride, shellac based acrylic resin, and polyester. Given that three of the four polymers disclosed by Zhu possess anionic functional groups, it is clear that the group of polymers disclosed by Zhu is not a large group from which to choose the presently claimed polymer. Further, Zhu discloses that the conductivity agent is ammonium, alkali, or alkaline earth metal salt. Given that one of three salts contains polyvalent ions, this is not a large group from which to choose the presently claimed salt. While there is no disclosure in Zhu of modified pigment as presently claimed, this is why

Zhu is used in combination with WO 96/18695, which teaches the use of pigment identical to that presently claimed and provides proper motivation to combine the references.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use modified pigment of WO 96/18695 in the ink of Zhu, and thereby arrive at the claimed invention.

**Allowable Subject Matter**

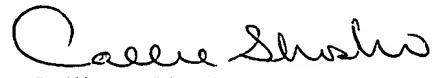
12. Claims 3, 29, 33, and 49 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 3, 29, 33, and 49 would be allowable if rewritten in independent form as described above given that the “closest” prior art, namely, Betto et al. (U.S. 6,406,606), Takahashi et al. (U.S. 2004/0082686), and Zhu (U.S. 5,889,083), is each drawn to aqueous ink which is in direct contrast to present claims 3, 29, 33, and 49 which require non-aqueous inks.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 571-272-1123. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Callie E. Shosho  
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Art Unit 1714

CS  
3/17/05